



AGENCY: Utah Division of Air Quality (UDAQ)
TITLE: Science for Solutions Research Grant - FY 2021
ACTION: Request for Proposals (RFP)

DATES:

The closing date and time for receipt of proposal submissions are January 17, 2020, 11:59 p.m., Mountain Daylight Time (MDT). Proposal packages must be submitted electronically to UDAQ via email to daqresearch@utah.gov by January 17, 2020, 11:59 p.m., MDT in order to be considered for funding. Proposals received after the closing date and time will not be considered.

SUMMARY:

This notice announces the availability of funds and solicits proposals for projects designed to assist UDAQ in improving its scientific understanding in areas deemed important towards improving Utah's air quality and meeting federal air quality standards. Proposals must meet at least one of the goals and priorities defined in this RFP announcement (see B. Goals and Priorities section).

FUNDING/AWARDS:

The total estimated available funding for this competitive opportunity is approximately \$500,000. UDAQ anticipates awarding approximately 3 - 8 grants from this announcement, subject to availability of funds, the quality of proposals received, and other applicable considerations. Applicants are limited to three proposal submissions per funding cycle. Previously submitted proposals that were not funded are eligible for resubmission.

ELIGIBILITY:

Competition under this announcement is being limited to a subset of eligible applicants. Eligible applicants include research institutions (including private companies), federal/state/local/tribal government agencies, and public/private universities.

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A. Background

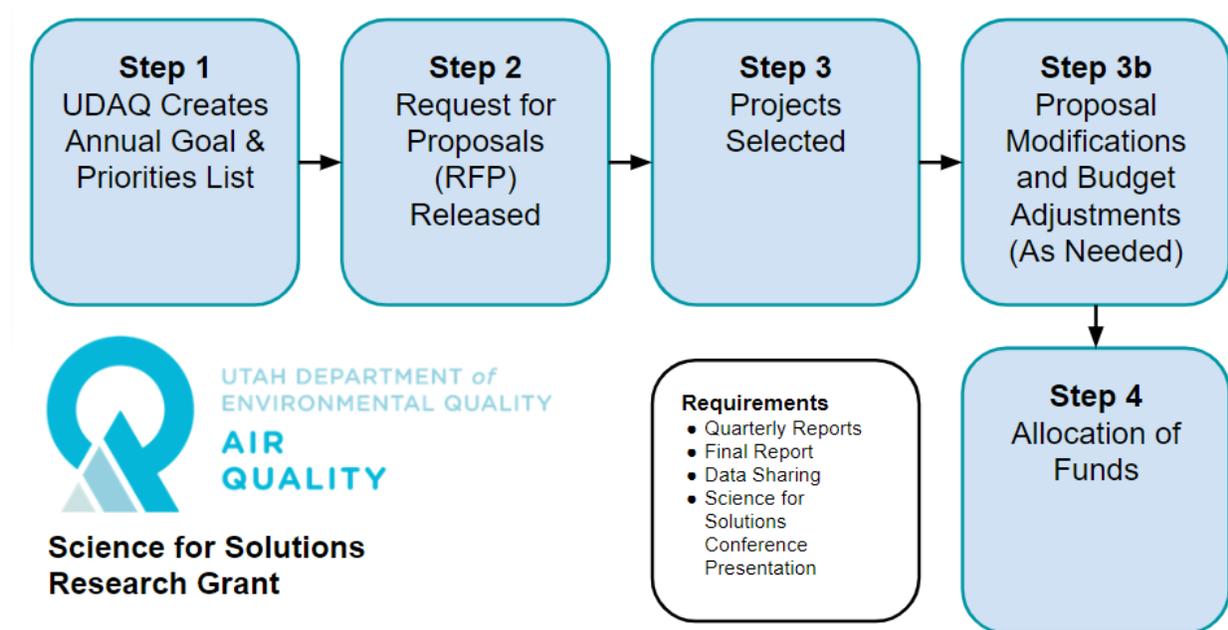
The Science for Solutions research grant was established to solicit help from the research community in understanding and addressing important Utah air quality problems. The broad issues that challenge Utah's ability to meet federal air quality standards are:

1. Wintertime ozone pollution in the Uinta Basin region
2. Summertime ozone pollution along the Wasatch Front
3. Wintertime PM2.5 pollution along the Wasatch Front and Cache Valley

Despite decades of progress, it is difficult for Utah to meet federal air quality standards. The atmospheric chemistry and emissions sources that contribute to elevated PM2.5 and ozone concentrations in Utah are complicated. In order to meet federal air quality standards, UDAQ would like to further its understanding of air pollution precursors. UDAQ would also like to expand and enhance its ability to guide effective regulatory policy. To better meet these objectives, UDAQ is soliciting air quality project proposals through an established annual grant.

Science for Solutions Research Funding Process

The following flowchart provides an overview of the process used in allocating Science for Solutions research funding:



Step 1: UDAQ develops a list of goal and priority topics (e.g. improving ammonia inventory). This list will be re-evaluated each year and will change based on the specific research needs at that particular time.

Step 2: An RFP will be developed based on annual Goals and Priorities list developed in Step 1. The RFP will be posted on DAQ's webpage [here](#).

Step 3: A UDAQ panel will use the grant scoring criteria documented in the RFP to review, score, and ultimately select project proposals to fund. If needed, consultation with individual subject matter experts (SME) will occur prior to award selection.

Step 3b: The UDAQ panel, especially after consultation with SME, may require slight project proposal modifications. Budget modifications may also be needed to ensure adequate funding for all selected projects.

Step 4: Each project that UDAQ decides to fund will need to go through the necessary state contracting process. July 1st is the earliest funds will be available.

B. Goals and Priorities

UDAQ is soliciting proposals for projects designed to help the State of Utah meet federal air quality standards. To be considered for funding under this RFP, each project proposal must address at least one of the following topics:

AIR QUALITY MODELING IMPROVEMENTS

Air quality models remain important tools for guiding policy makers in preparing State Implementation Plans to demonstrate compliance with federal air quality standards. Modeling enables UDAQ to demonstrate and quantify the effectiveness of future emission control strategies. Better characterization of the complex meteorological features associated with cold air pool as well as spring- and summer-time episodes is needed. Improved representation of the chemical mechanisms as well as physical processes relevant to ozone and PM_{2.5} photochemistry are also needed.

- Numerical representation of complex and missing chemical mechanisms
- Surface land use characterization and topography
- Urban canopy models and anthropogenic heat fluxes
- Albedo and snow cover representation
- Snow surface chemistry
- Cloud cover representation
- Nitric acid and organics deposition
- Exchange and transport processes

- Aerosol-radiation-cloud interactions
- Top-down turbulent erosion

EMISSIONS INVENTORY IMPROVEMENTS

Recent studies along the Wasatch Front and Uinta Basin highlighted discrepancies between inventory estimates and measurements of several key precursors to the formation of ozone and PM_{2.5}. These include carbonyls, hydrocarbons, alcohols, halogens, etc. Reconciling differences between inventory estimates and observations is needed for improved modeling of ozone and PM_{2.5}. Information on the sources, spatial and temporal distribution of chemical precursors is also needed. This entails a better representation of:

Uinta Basin:

- Source-specific organic compounds emission rate estimates
- Source-specific organic compounds speciation profiles
- Fugitive and missing emission sources (e.g. abandoned wells, gathering pipelines, pigging, water tank emissions)
- NOx emissions
- Methane emissions and ozone formation impacts
- Activity data
- Model of stochastic emissions (e.g. "super-emitters", equipment malfunction)

Wasatch Front:

- Halogens emission rate estimates
- Speciated volatile organic compounds
- Source-specific emission rate estimates for volatile organic compounds
- Emissions from cold-starting engines and catalytic technologies

AIR EXCHANGE PROCESSES AND POLLUTANTS MASS TRANSPORT

Air mass exchanges are important meteorological processes affecting the transport of air pollutants. Air exchanges across the Great Salt Lake, different Utah valleys, and canyons as well as between the polluted boundary layer and free troposphere affect the transport and mixing of key precursors to PM_{2.5} during winter. Regional meteorological processes also lead to long-range transport and stratospheric intrusion of ozone. A more detailed characterization of these processes and their impact on the transport of air pollutants is needed. Better estimates of the mass transport of air pollutants are also needed.

- Lake-land interaction
- Canyon flows
- Inter-basin exchange
- Air pollutants mass transport estimates

- Oxidants exchange between cold air pool and free troposphere
- Long-range transport and stratospheric intrusion of ozone and its precursors

PM_{2.5} FORMATION AND PRECURSOR GASES

To better inform air pollution control strategies in northern Utah, it is necessary to understand the complex chemical processes that contribute to secondary PM_{2.5} formation. Secondary PM_{2.5} accounts for over 50% of total PM_{2.5} during winter-time air pollution episodes. It is produced from complex atmospheric chemistry that involves several different gaseous compounds. UDAQ would like to better understand and quantify the sources of compounds contributing to winter-time air pollution along the Wasatch Front and Cache Valley. Information on their spatial, temporal, and vertical distribution as well as mass emission and photolysis rates are also needed. Compounds and parameters of interest include, but are not limited to:

- Halogens
- Volatile organic compounds
- Oxidized nitrogen compounds
- Atmospheric radicals
- Ammonia
- Photolysis rates

PM_{2.5} CHEMICAL COMPOSITION AND SOURCES

Aerosol chloride plays an important role in winter-time PM_{2.5} formation. In the presence of excess ammonia, hydrochloric acid will partition to aerosol particles forming ammonium chloride. Particulate chloride can also contribute to the formation of nitryl chloride, which is a source of radicals for daytime photochemical production of ozone and nitrate. Emission sources of aerosol chloride are, however, unclear. Better identification of major chloride sources, including the Great Salt Lake, road salt, dry salt beds and industrial sources is needed. The contribution of organic aerosol sources to PM_{2.5} is also unclear.

- Particulate chloride sources
- Organic aerosol

SOURCE CONTRIBUTIONS TO SUMMER-TIME OZONE

The Wasatch Front often experiences exceedances of the national ambient air quality standard for ozone during the summer. Regulating locally-formed ozone to reach attainment is complicated by the fact that ozone has a mix of different sources. These include stratospheric transport, wildfires, biogenic emissions as well as international and US anthropogenic sources. To help establish control regulations, further research is needed to determine the contributions from these sources to summer-time surface ozone.

- Biogenic emissions
- Anthropogenic emissions
- International transport
- Wildfires
- Stratospheric intrusion
- Lightning-induced NO_x

C. Proposal Requirements

All proposals must meet at least one of the goals and priorities defined in this RFP announcement (see B. Goals and Priorities section). Proposals must include a summary information page, a detailed scope of work, detailed budget, timeline, and a list of key personnel and their roles and responsibilities. Proposals should be submitted as a PDF and not exceed 15 pages in length.

Summary Information Page

The summary information page must include the following information:

- I. Project Title
- II. Applicant Information - Include applicant (organization) name, address, principal investigator (PI), phone number, and email address.
- III. Sponsored Projects/Research Office Information (only required for university applicants). Please include contact name, address, phone number, email address.
- IV. Funding Requested - Specify the total amount of funding you are requesting from UDAQ. Please also list matching funds (as a percent of total project cost), if applicable.
- V. Project Period - Provide the beginning and ending dates of the project. (The earliest funds are available is July 1st, 2020).

Scope of Work

The Scope of Work must include the following information:

Abstract - Provide a brief overview of the project, summarizing the problem/topic of focus, the rationale, key issues, previous work related to the proposed research topic, and goals addressed.

Basis and Rationale - Outline the nature of the problem or science question(s) that this research will address. UDAQ will evaluate projects based on whether the proposed project meets at least one of the goals and priorities defined in this RFP

announcement (see B. Goals and Priorities section). Specifically identify the goals and priorities met.

Technical Approach - Describe how the proposed project will be completed by outlining the specific tasks that will be performed. Include the methods and technology that will be used to reach specific objectives. If the proposed project includes more than one research group, the role of each group must be described. If applicable, describe the data analysis plan including how the data analysis will be performed and how the data will be used. Provide statistical methods, software tools, and any analytical methods that will be utilized. Outline a plan for quality control and quality assurance.

Expected Outputs and Outcomes - Describe the expected quantitative and qualitative outcomes and outputs of the proposed project, and how the results of the project will be evaluated.

Deliverables - Describe the deliverables you plan to provide to UDAQ. Required deliverables include: reports (quarterly and final), data sharing, and Science for Solutions conference participation. This section must include a data sharing plan describing how the awardee will satisfy the data sharing requirement. See D. Awardee Requirements section for descriptions of required deliverables, including data sharing, as well as formatting guidance for quarterly and final reports. Other deliverables may be project dependent. For example, additional deliverables may include model code or implementation, data and/or data analysis, and/or interim findings.

Schedule - The anticipated project completion date must be provided in the proposal. Include a timeframe and approximate start date for each proposed task (as outlined in the "Technical Approach" section of the Scope of Work). It should be noted that there is some flexibility within the overall time frame of a particular project. UDAQ may accept projects that are either shorter or longer than one year. However, the project timeline must not exceed three years. Note: the earliest date at which funds are available is July 1st.

Budget

Provide a detailed budget, including the following information:

1. Personnel costs, including time and rates (e.g. environmental scientist for x hrs @ y \$/hr).
2. Costs for specific equipment, materials/supplies, fringe benefits, including details of how these costs were calculated.
3. Travel costs, including a brief description of travel needs.
4. Indirect costs, including details of how these costs were calculated.

5. Any additional costs, including as much detail as possible to ensure spending is transparent and accounted for.

Any pass-through funding must be detailed in the same manner as the main budget.

Important Note: Relating to overhead and indirect costs, UDAQ prefers that no overhead (indirect costs) are included in the project. However, if overhead costs are necessary, UDAQ requires that overhead costs not exceed 10% of the total cost of the project.

It is important to note that UDAQ will evaluate proposal budgets for the following:

1. The budget's appropriateness, including the amount allocated to each goal or task, and its adequacy to support and complete the proposed work.
2. Whether the budget includes specific amounts for each proposed task (as outlined in the "Technical Approach" section of the Scope of Work).
3. The completeness and detail of the budget.

Personnel Roles and Responsibilities

Applicants must include a summarized list of the qualifications of the project manager or PI and other key personnel, as well as a description of the main roles and responsibilities of each of the noted personnel. This description must include the names, positions, and roles of all who are involved in the project. For example, "Jane Doe, field technician, will collect field samples and provide equipment maintenance as needed."

Important Note: If your project requires using Utah DAQ resources (e.g., labor, sampling media, equipment), then please contact us (daqresearch@utah.gov) prior to submitting your proposal. Please refrain from contacting DAQ employees directly.

D. Awardee Requirements

Quarterly Reports

Award recipients of this grant opportunity are required to provide UDAQ with quarterly reports relating to project progress. A UDAQ scientist will be assigned as a contact to every awarded project's principal investigator. Upon accepting the award, the project's principal investigator will be shortly notified who their UDAQ contact is. The UDAQ contact will be responsible for reviewing quarterly and draft final reports, in addition to serving as a general contact to the principal investigator. Quarterly reports should be sent to daqresearch@utah.gov.

Quarterly reports are due every quarter until project completion. UDAQ has provided a template for completing quarterly reports. Download the template [here](#) and submit to UDAQ according to the following timeline, when applicable:

- Report due September 30
- Report due December 31
- Report due March 31
- Report due June 30

Final Report

A draft final report is due to UDAQ 90 days after project completion, Final reports (draft and revised), should be sent to the project's UDAQ contact.

UDAQ will have up to one month to review the draft final report and send comments and suggestions to the project's principal investigator. After receiving UDAQ's comments and suggestions, the principal investigator will have one additional month to submit a revised final report to UDAQ. The draft final report will not be published by UDAQ, but should still be considered publicly available. All final reports will be posted and made publicly accessible via UDAQ's website.

The draft final project report, which is due 90 days after the completion of the project, must include a narrative including the following components:

Title Page: Include the title of the project, PI and team members, organization, dates of the project, and the date of submission of the report.

Abstract or Executive Summary: Provide a brief overview of the project, summarizing the problem/topic of focus, the rationale, key issues, and goals addressed.

Background and Significance: Provide a description of background, context, settings, participants, and significance.

Objective: Explain the objective of the study, and summarize the project's specific purpose, goals and objectives as recorded in the original request for funding.

Methods: Provide a description of the study design including specific methods used to approach the project's aim. Include data sources/collection, measures, and limitations.

Deviations: Explain any deviations from the project's original aims.

Results: Present the major results/findings/outcomes and their implications for air quality in Utah including conclusions and significance of the findings.

Future Direction: Discuss potential future related research projects.

Data Management: Describe where data from the study will be housed or shared.

Bibliography: Cite references.

Conference Presentation

Grant recipients are required to give a presentation about the results or progress of their funded project at an Air Quality: Science for Solutions conference (oral or poster presentation assigned by the conference committee). The presentation can be given either while the project is being completed or immediately following the completion of the project. The conference is typically held in Spring (late March or early April).

Air Quality: Science for Solutions is an annual conference coordinated between UDAQ, University of Utah, Utah State University, Weber State University, and Brigham Young University. The location of the conference changes within Utah every year. Please see the following website for conference details [here](#).

Data Sharing

The grantee is required to share processed/finalized data with UDAQ and as appropriate make data publicly accessible within 8 months of project completion. This timeline is meant to enable grantees to publish results and data in peer-reviewed journals without conflict. Data can be shared via the UDAQ website or via the grantee's organization webpage. Modifications to this default data sharing policy must be discussed with and approved by UDAQ. Data must be publicly available for at least 10 years after completion of the awarded project. The grantee must provide detail of how they plan to fulfill this data sharing requirement in their project proposal.

E. Award Information

What is the amount of funding available?

The total estimated funding expected to be available for awards under this competitive opportunity is nearly \$500,000.

Partial Funding

UDAQ will not award less than the funds asked for in the project proposal without prior discussion with the PI of the selected project.

How many awards will UDAQ allocate?

UDAQ anticipates to allocate approximately 3 - 8 awards under this announcement, subject to the availability of funds, quality of evaluated proposals, and other applicable considerations. UDAQ reserves the right to create additional awards under this announcement if additional funding becomes available after the original selections.

What is the project period for awards resulting from this solicitation?

UDAQ may award projects that are either shorter or longer than one year. However, the time limit from the disbursement of funds to project completion is a maximum of three years. A specific project period will be defined in each individual project contract.

Important Note: All multi-year funding is dependent upon renewal of Science for Solution grant funding from the Utah State Legislature. Multi-year contracts may be terminated if a change in State legislation affects the Science for Solutions grant allocation.

Matching Funds

Matching funds are not required under this competition. However, some preference is given for projects that bring in additional funding from other sources (see Scoring Criteria). If matching funds are part of the proposed project budget, awarded PI's are still responsible for deliverables to UDAQ regardless if matching funds were successfully obtained or not.

Will research funding be fixed cost or reimbursable?

Funding can be either fixed cost or reimbursable up to a set amount.

Indirect Costs (only applicable to Universities)

Indirect costs can only be 10% of the total cost of the project. Each University listed on the grant application can charge indirect costs on their portion of the funding. No indirect costs can be charged by the primary University on pass-through funds. Only the University receiving the pass-through funds may charge indirect costs on these funds.

Funding limits for projects

Funding limits for projects will be discussed on a case by case basis. Keeping in mind UDAQ's \$500,000 funding cap, a project may not necessarily be excluded for being too expensive. UDAQ may request budget adjustments from a PI after the project selection process.

Can a previously submitted, but un-awarded proposal, be resubmitted?

Yes. UDAQ priorities may change year-to-year, so researchers are welcome to resubmit a past proposal as long as the project proposal targets at least one of UDAQ's Goals and Priorities.

F. Scoring Criteria

All grant applications will be scored and ranked by UDAQ using the scoring criteria outlined below. The highest possible score for a grant application is 100 points. The following shows what elements make up the proposal score and how much weight is attributed to each element:

- Proposed Project Meets Air Quality Needs (60 pts)
 - Proposed project explicitly states the goals and priorities defined in the grant request. - 5 pts
 - Proposed project identifies the extent to which it meets the goals and priorities defined in the grant request. - 20 pts
 - Proposed project is technically feasible and the applicant and key personnel demonstrate sufficient technical expertise to perform the work. - 20 pts
 - Proposed research and study outcomes lend themselves to regulatory applications and will yield measurable benefits that could easily be reported by UDAQ to the Utah Legislature. - 15 pts

- Research Costs/Budget (30 pts)
 - The proposal includes a well-defined, tabulated budget separated by task (see example, below). Spending is accounted for and is transparent. - 20 pts
 - The proposal includes matching funds from a source other than UDAQ. - 5 pts
 - The proposal leverages other resources. - 5 pts
 - Existing Equipment and/or expertise
 - Other studies and research proposals

- Institution and Research Team (10 pts)
 - The proposal provided by an in-state institution - 5 pts
 - The proposal provided is a collaborative project including more than one research group. - 5 pts

Important Note: UDAQ reserves the right to consider which proposals are most valuable to meeting agency goals at the time of review and will make final award decisions accordingly.

Budgets should be tabulated, similar to the example shown below.

| | Task 1 | Task 2 | Total | Matching Funds | Grand Total |
|--|--------|--------|-------|----------------|-------------|
| PERSONNEL | | | | | |
| Scientist I @ x\$/hour x X hours | | | | | |
| Scientist II @ y\$/hour x Y hours | | | | | |
| FRINGE BENEFITS @ x % rate | | | | | |
| SUPPLIES | | | | | |
| Lines and tubings, etc. | | | | | |
| EQUIPMENT | | | | | |
| Instrument 1 @ \$/unit x X units | | | | | |
| TRAVEL | | | | | |
| Travel @ x\$/mi x X miles x miles/trip x X trips | | | | | |
| CONTRACTUAL | | | | | |
| Consultant A | | | | | |
| OTHER | | | | | |
| Publication fee, etc. | | | | | |
| TOTAL DIRECT COSTS | | | | | |
| TOTAL INDIRECT COSTS @ x% | | | | | |
| TOTAL PROJECT COST | | | | | |

G. Important Calendar Dates

The following dates and deadlines are directly related to this RFP announcement. Please note these dates as you prepare your proposal:

- RFP Announcement - November 4, 2019
- Proposal due to UDAQ - January 17, 2020
- Proposal review process begins - January 20, 2020
- Requested modifications & budget adjustments due, if applicable - April 30, 2020
- Final awardees selected and announced - May 4, 2020
- Earliest that funds are disbursed - July 1, 2020

H. Submitting a Proposal

- Proposals must substantially comply with the proposal submission instructions and content requirements set forth in this RFP or else they will not be reviewed.
- In addition, proposals must be submitted via email to dagresearch@utah.gov on or before the proposal submission deadline. Applicants are responsible for following the submission instructions of this announcement to ensure that their proposal is timely submitted.

- To submit proposals, send your complete proposal application package via email to daqresearch@utah.gov. The subject heading should include the project title and the applicant (organization) name, and FY2021.
- Proposals submitted after the submission deadline will be considered late and deemed ineligible without further consideration unless the applicant can clearly demonstrate that it was late due to UDAQ mishandling or because of technical problems associated with the state email system used for submission.
- Applicants affiliated with Universities must submit their proposals through their specific sponsored projects/research office.

I. Contact Information

Please contact Chris Pennell (phone: 801-536-4098; email: cpennell@utah.gov) for questions relating to this RFP.